

22626

22223

3 Hours / 70 Marks

Seat No.

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- Instructions* –
- (1) All Questions are *Compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. **Attempt any FIVE of the following:** **10**
- a) Define the following terms related to illumination
 - i) Luminous intensity
 - ii) LUX
 - b) State Lambert's Cosine law of illumination
 - c) List modes of heat transfer.
 - d) State any four factors governing the selection of electric drives.
 - e) State different types of traction system used in India.
 - f) State any two desirable characteristics of tariff.
 - g) List two disadvantages of low power factor.

P.T.O.

2. Attempt any THREE of the following: 12

- a) Distinguish between incandescent lamp and fluorescent lamp on the basis of following.
 - i) Initial cost
 - ii) Lumen output
 - iii) Energy saving
 - iv) Brightness
- b) Explain direct arc furnace method with diagram.
- c) An electric motor has load variation as given below.
 - i) Torque 140 Nm for 20 minutes
 - ii) Torque 40 Nm for 10 minutes
 - iii) Torque 200 Nm for 10 minutes
 - iv) Torque 100 Nm for 20 minutes

If the speed of the motor is 720 rpm, calculate the power rating of the motor.
- d) Draw and label the various parts of A.C. electric locomotive.

3. Attempt any THREE of the following: 12

- a) State the various types of lighting schemes used in illumination and explain any two of them.
- b) Explain working principle of dielectric heating. State its two application.
- c) Explain the factors on which shape and size of car of elevator depends.
- d) State any four advantages of high power factor for electric supply system.

4. Attempt any THREE of the following: 12

- a) Write classifications of electrical welding system.
- b) With neat diagram, explain the plugging method applied to d.c. series motor.
- c) A consumer has a maximum demand of 250 KW at 50% load factor. If the tariff is Rs. 100 per KW of maximum demand plus 20 paise per KWh. Find the overall cost per KWh.
- d) Define average speed and schedule speed in traction system. List any two factors affecting the schedule speed.
- e) Write any eight desirable characteristics of traction motors.

5. Attempt any TWO of the following: 12

- a) A 20 KW single phase 220 V resistance oven employs a circular nichrome wire for its heating element. If wire temperature is not exceed 1170°C and temperature of charge to be 500°C . Calculate the diameter and the length of the wire. Take $K=0.57$, $e=0.95$ and $\rho=1.09 \times 10^{-6}$ ohm-meter.
- b) Explain electrical braking. State any six requirements of ideal braking system.
- c) A trapezoidal time curve of train consists of :
 - i) Uniform acceleration of 6 kmphs for 25 seconds.
 - ii) Free running for 10 minutes.
 - iii) Uniform deceleration of 6 kmphs to stop the train.
 - iv) A stop time of 5 minutes.

Find the distance between the stations, average and schedule speed.

6. Attempt any TWO of the following:**12**

- a) Differentiate between DC welding and AC welding on the basis of
 - i) Equipment
 - ii) Cost
 - iii) Power factor
 - iv) Operating efficiency
 - v) Arc stability
 - vi) Heating
 - b)
 - i) List various types of current collection system in electric traction.
 - ii) State main features of metro rail and monorail traction line services.
 - c)
 - i) State Bombay Lift Act 1939. (Latest Amendment)
 - ii) List any four safety and protective devices used in elevator.
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